AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A semiconductor wafer processing system, comprising:
a reactor for processing at least one semiconductor wafer;
at least one load lock coupled to the reactor; and
a magnetically coupled linear servo-drive mechanism located within the at least one load lock to transfer wafers to and from the reactor, the servo-drive mechanism comprising:
a carriage for holding a wafer;
a driven magnet array within the carriage;
a guiding mechanism for guiding the carriage linearly;
a cylindrical tube housing a linear actuator and isolating the actuator from a wafer environment in the load lock, a driving magnet array inside the cylindrical tube and mounted to an output of the linear actuator, the driving magnet array magnetically coupled to the driven magnet array mounted within the carriage;
an engine coupled to the actuator to drive the actuator; and
a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration~~.~~; and
wherein the driven magnet array forms a magnetic rotation lock with the driving magnet array.

Claim 2 (original): The system of claim 1, wherein the reactor uses chemical vapor deposition.

Claim 3 (previously amended): The system of claim 1, wherein the driven magnet array includes permanent magnets that are radially aligned within the carriage and have alternating polarities.

Claim 4 (previously amended): The system of claim 3, wherein the actuator comprises:
a shaft coupled to a pulley system, the pulley system coupled to the engine; and
a nut coupled to the driving magnet array, the driving magnet array including permanent magnets arranged radially and having alternating polarities, the nut being coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates.

Claim 5 (previously amended): The system of claim 4, wherein the driven magnet array includes at least two magnets having opposite polarities.

Claim 6 (previously amended): The system of claim 5, wherein the driving magnet array has the same number of magnets as the driven magnet array.

Claim 7 (original): The system of claim 1, wherein the guiding mechanism includes a linear ball slide.

Claim 8 (previously amended): The system of claim 1, wherein the cylindrical tube is non-magnetic.

Claim 9 (previously amended): The system of claim 4, wherein the shaft is a ball screw shaft.

Claim 10 (currently amended): A magnetically coupled linear servo-drive mechanism for use in a load lock of a semiconductor fabrication system, comprising:

a carriage having a first magnet array;

a guiding mechanism for guiding the carriage linearly;

a cylinder housing an actuator, the actuator magnetically coupled to the carriage using a second magnet array;

an engine coupled to the actuator to drive the actuator; and

a controller coupled to the engine to control the engine for optimizing transfer times and controlling acceleration~~.~~; and

wherein the first magnet array forms a magnetic rotation lock with the second magnet array.

Claim 11 (cancelled)

Claim 12 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the first magnet array includes permanent magnets that are radially aligned within the carriage and have alternating polarities.

Claim 13 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 12, wherein the actuator comprises:

a shaft coupled to a pulley system, the pulley system coupled to the engine;

a nut coupled to the second magnet array, the second magnet array includes permanent magnets arranged radially and having alternating polarities, the nut coupled to the shaft such that the nut moves axially along the length of the shaft when the shaft rotates.

Claim 14 (original): The magnetically coupled linear servo-drive mechanism of claim 13, wherein the first magnet array includes at least two magnets having opposite polarities.

Claim 15 (original): The magnetically coupled linear servo-drive mechanism of claim 14, wherein the second magnet array has the same number of magnets as the first magnet array.

Claim 16 (original): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the guiding mechanism includes two guide shafts.

Claim 17 (original): The magnetically coupled linear servo-drive mechanism of claim 10, wherein the cylinder is non-magnetic.

Claim 18 (previously amended): The magnetically coupled linear servo-drive mechanism of claim 13, wherein the shaft is a ball screw shaft.

Claim 19 (original): The magnetically coupled linear servo-drive mechanism of claim 13, further comprising a four-axis gimbal between the nut and the second magnet array.

Claim 20 (currently amended): A method for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

placing a wafer on a carriage, the carriage having a first magnet array;

magnetically coupling an actuator to the carriage using a second magnet array to allow propulsion of the carriage ~~and to form a rotation lock~~, the actuator isolated from a vacuum environment; ~~and~~

forming a magnetic rotation lock between the first magnet array and the second magnet array; and

translating the actuator linearly.

Claim 21 (original): The method of claim 20, wherein the translating includes optimized motion.

Claim 22 (previously amended): A device for linearly translating a wafer in a semiconductor wafer fabrication system, comprising:

means for placing a wafer on a carriage, the carriage having a first magnet array;

means for magnetically coupling an actuator to the carriage, the actuator isolated from a vacuum environment, the actuator having a second magnet array rotationally locked with the first magnet array; and

means for translating the actuator linearly.